202301UECM2453OE4a

Start again

Review of preview

Started on	Sunday, 16 April 2023, 04:20 PM
Completed on	Sunday, 16 April 2023, 04:20 PM
Time taken	20 secs
Grade	**0** out of a maximum of 10 (**0**%)

1
Marks: 1

Consider the following 3-period binomial interest rate tree where the initial interest (continuously compounded) rate is 11% and rates can move up or down by 2.4% at the end of each year. The risk-neutral probability of an up move is 0.57.

$r_0 = 11\%$; $r_d = 8.6\%$; $r_u = 13.4\%$; $r_{dd} = 6.2\%$; $r_{du} = 11.0\%$; $r_{ud} = 11.0\%$; $r_{uu} = 15.8\%$;

Find the price of a two-year 921.0-strike call on a 1-year zero-cuopon bond of face value 1000. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 2.87
Marks for this submission: 0/1.

2
Marks: 1

Consider the following 3-period binomial interest rate tree modelling the effective annual yields. The risk-neutral probability of an up move is 0.45.

$r_0 = 7\%$; $r_d = 5.81\%$; $r_u = 8.4\%$; $r_{dd} = 4.82\%$; $r_{du} = 6.97\%$; $r_{ud} = 6.97\%$; $r_{uu} = 10.08\%$

Find the yield rate of a three-year 19% annual-coupon bond of face value 100. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.069532
Marks for this submission: 0/1.

3
Marks: 1

You are given the following binomial interest rate tree modeling the annual effective interest rate:

$r_0 = 8.7\%$, $r_u = 10.741\%$, $r_d = 7.817\%$,
$r_{uu} = 13.922\%$, $r_{ud} = r_{du} = 11.539\%$ $r_{dd} = 8.197\%$

The risk-neutral probability that the annual effective interest rate moves up or down is 0.5. Find the price of a caplet with a guaranteed rate of 10% for a loan of 100 for year 3. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 1.289975
Marks for this submission: 0/1.

4
Marks: 1

Consider the following 3-period binomial interest rate tree for effective annual rates. The risk-neutral probability of an up move is 0.6.

$r_0 = 9.4\%$; $r_d = 8.1\%$; $r_u = 11.9\%$

r_{dd} = 5.7%; r_{ud} = r_{du} =10.1%; r_{uu} = 13.7%

Find the price of a 9.4% interest rate cap on a 100 three-year loan with annual interest payments. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 2.6862
Marks for this submission: 0/1.

5
Marks: 1

Consider the following incomplete BDT tree model for the effective annual interest rates:

r_0 = 8.8%, r_u = 13.4%, r_d = 8.5%,
r_{uu} = 16.2%, r_{ud} = r_{du} = 13.3%
r_{udd} = 10.9%, r_{uuu} = 17.6%

Calculate the price of a 87.5-strike 2-year put on a 2-year 5% annual coupon bond with face value 100, maturing at time 4. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 1.2685
Marks for this submission: 0/1.

6
Marks: 1

Consider the following incomplete BDT tree model for the effective annual interest rates:

r_0 = 9.1%, r_u = 12.9%, r_d = 8.9%,
r_{uu} = 16.5%, r_{ud} = r_{du} = 14.3%
r_{udd} = 10.8%, r_{uuu} = 17.5%

Calculate the price of a 3-year caplet with a cap rate of 10.3% for the notational amount of 100. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 2.9181
Marks for this submission: 0/1.

7
Marks: 1

In a Black-Derman-Toy tree with period of one year:

- The lognormal yield volatility of 3-year zero-coupon bonds after two years is 0.12.
- The lognormal yield volatility of 2-year zero-coupon bonds after one years is 0.11.
- The effective annual yield on 1-year zero-coupon bonds issued at the end of two years is 0.03 at the lowest node.
- The effective annual yield on 1-year zero-coupon bonds issued at the end of one year is 0.048 at the lowest node.

Determine the lognormal yield volatility of 3-year zero-coupon bonds after one year. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.1138
Marks for this submission: 0/1.

8
Marks: 1

You are given then following information:

Bond maturity (years)	1	2	3
Zero-coupon bond price	0.9764	0.9341	0.8909

A 1-year European call option gives you the right to purchase a zero-coupon bond that matures at time 3 for 0.92. The bond forward price is lognoemally distributed with volatility 0.14. Using the Black formula, calculate the price of the call option. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.0463
Marks for this submission: 0/1.

9
Marks: 1

You are given the following information for a 1-year zero-coupon bonds:

t	1	2	3	4	5
(t-1)- year forward price for 1-year bond	0.91	0.9	0.89	0.88	0.87
Volatility of t- year prepaid forward price for 3-year bond	0.02	0.04	0.06	0.08	0.1

Using Black's formula, calculate the price of a 2-year European call option with strike price 0.65 on a 3-year bond. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.0288
Marks for this submission: 0/1.

10
Marks: 1

Let P(0,T) be the time-0 price of a zero-coupon bond that pays 1 at time T. You are given:

T	P(0,T)	Var[ln P(T, $T_{0.5}$]/T]
0.5	0.9289	0.063
1	0.8775	0.0729
1.5	0.8312	0.0999
2	0.7905	0.1156

Calculate the price of 1.5-year 0.92-strike put on a 6-month zero-coupon bond of face value 1 using Black formula. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.1078
Marks for this submission: 0/1.